

## **Numerical analysis of the load bearing capacity of pinended hybrid headed columns under uniaxial loading.**

### **ABSTRACT**

The behaviour of fully encased composite columns loaded in axial compression through the concrete core and whole cross-section was studied. The primary objective is to develop a complete non-linear finite element model that could represent the behaviour of fully encased composite columns tested under uniaxial compression in the laboratory. A total of 10 models were analyzed using finite element simulations and the results obtained were compared with laboratories' test results. The finite element package LUSAS 14 has been used to carry out non-linear analyses of models in order to study the ultimate load behaviour and ultimate load-carrying capacity of the columns. The effects of parameters such as length of composite columns and loading condition on the ultimate load capacity have been examined. This study implies that load condition has significant influence on the behaviour and strength of the composite columns. Moreover, it is suggested that the finite element models were able to simulate various loading conditions, with very good accuracy.

**Keyword:** Composite column; Load-carrying capacity; Finite element simulation; Column head.